

CLAIMS

1. A method of welding comprising:

providing a first workpiece that is made of a material that conducts electricity;

providing a second workpiece that is made of a material that conducts electricity and has a plurality of projections formed therein;

applying a material between each projection of said plurality of projections, said material has an electrical conductivity that is lower than the conductivity of said second workpiece;

disposing an area of said first workpiece at said plurality of projections of said second workpiece; and

conducting electricity through said first workpiece and through at least one of said plurality of projections of said second workpiece.
2. The method of claim 1, further comprising melting said plurality of projections progressively.
3. The method of claim 1, wherein a first set of said plurality of projections has a height and a second set of said plurality of projections has a different height.
4. The method of claim 3, wherein said height and said different height of each of said plurality of projections ranges from 0.2 millimeter to 2.5 millimeter.
5. The method of claim 1, further comprising connecting a first electrode to said first workpiece and connecting a second electrode to said second workpiece.
6. The method of claim 1, wherein said first and second workpiece are formed by hydroforming.
7. The method of claim 1, further comprising said plurality of projections are formed by hydroforming.

8. The method of claim 1, wherein said material is an adhesive.
9. The method of claim 1, wherein said material is non-electrically conductive.
10. The method of claim 1, wherein said applying said material includes applying said material through a nozzle.
11. The method of claim 1, wherein said first workpiece is hollow and has a first wall thickness and said second workpiece is hollow and has a second wall thickness.
12. The method of claim 1, wherein each of said plurality of projections has a length, said length ranges from 0.4 to 0.7 of a width of said first workpiece.
13. The method of claim 1, wherein each of said plurality of projections has a base width, said base width of each of said plurality of projections ranges from 0.8 to 10 millimeters
14. A projection weld bond system comprising:
 - a first workpiece that is made of a material that conducts electricity;
 - a second workpiece that is made of a material that conducts electricity and has a plurality of projections formed therein;
 - an area of said first workpiece is disposed at said plurality of projections;
 - a material that has an electrical conductivity lower than the conductivity of said second workpiece and is disposed between each of said plurality of projections;
 - and
 - means for conducting electricity through said first workpiece and through at least one of said plurality of projections of said second workpiece.
15. The system of claim 14, further comprising means for melting said plurality of projections progressively.

16. The system of claim 14, wherein a first set of said plurality of projections has a height and a second set of said plurality of projections has a different height.

17. The system of claim 16, wherein said height and said different height of each of said plurality of projections ranges from 0.2 millimeter to 2.5 millimeter.

18. The system of claim 14, wherein said means for conducting includes a first electrode connected to said first workpiece and a second electrode connected to said second workpiece.

19. The system of claim 14, wherein said low electrically conductive material is an adhesive.

20. The system of claim 14, wherein said material is non-electrically conductive.

21. The system of claim 14, wherein each of said plurality of projections has a length, said length ranges from 0.4 to 0.7 of a width of said first workpiece.

22. The system of claim 14, wherein each of said plurality of projections has a base width, said base width of each of said plurality of projections ranges from 0.8 to 10 millimeters.